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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/581,313	06/12/2000	SHUNJI KAMIJIMA	105955	7075

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EXAMINER

KANG, JULIANA K

ART UNIT	PAPER NUMBER
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2874

DATE MAILED: 04/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/581,313

Applicant(s)

KAMIJIMA ET AL.

Examiner

Juliana K. Kang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on January 17, 2003 (RCE).
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14, 17 and 19-27 is/are rejected.
- 7) ☐ Claim(s) 15, 16, 18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- ☐ Interview Summary (PTO-413) Paper No(s). _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

1. The request filed on January 17, 2003 for a Continued Examination under 37 C.F.R. 1.114 is acceptable and a RCE has been established. An action on the RCE follows.

Claim Objections

2. Claim 10 is objected to because of the following informality: claim 10 recites that a boundary surface between the first and the second microstructured portions comprise a metallic material. However, it does not appear that there is a boundary surface between the first microstructured portion (130) and the second microstructured portion (140) comprising a metallic material according to the specification. In the present specification on page 9 lines 7-17, applicant states that no metallic film should be placed between the first and second microstructured portions. This contradicts what is claimed in claim 10. Furthermore claim 19 of the present invention recites no metallic film. Appropriate correction or clear explanation is required if the Examiner is incorrect in interpreting the limitations that are recited in claim 10.

Specification

3. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: claim 21 recites the limitation "a planarizing step of planarizing said first microstructured portion and surroundings thereof before said molding step." According to the applicant's specification on pages 25 and 31, a planarizing step occurs after the molding step (page 25, especially lines 8-10) using a

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planarizing die 40 or during the molding step (page 31, especially lines 12-13) using transfer mold 41. If applicant does not agree with the Examiner, please indicate where the recited limitation is in the specification. Otherwise, correction is required to include the recited limitations in the specification without adding any new matters.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5. Claims 1-10 are rejected under 35 U.S.C. 102(e) as being anticipated by Takeuchi et al (U.S. Patent 5,862,275).

Regarding claims 1-4, Takeuchi et al disclose an optical waveguide display with movable actuators comprising a first microstructured portion (14, actuator), a second microstructured portion (32)(see column 15 lines 44-57), the first microstructured portion

connected to the second microstructured portion for driving the second microstructured portion to cause substantially all reflected incident light from a light source to travel in a direction almost perpendicular to an area between the first and second microstructured portions (see Fig. 1 and column 15 line 44-47 and column 16 lines 9-20). Please note that the recited limitation "formed by mold transfer" has not given patentable weight for the apparatus claim because the method of forming the device is not germane to the issue of patentability of the device itself.

Regarding claim 5, Takeuchi et al disclose a third microstructured portion (12), which is not driven by the first microstructure portion but relates to the second microstructured portion. Please note that the recited limitation "formed by mold transfer" has not been given patentable weight for the apparatus claim because the method of forming the device is not germane to the issue of patentability of the device itself.

Regarding claim 6, Takeuchi et al disclose a gap and step (20) (see Fig. 1).

Regarding claim 7, Takeuchi et al disclose the claimed invention. Please note that the recited limitation "formed by photolithography techniques" has not been given patentable weight because the method of forming the device is not germane to the issue of patentability of the device itself.

Regarding claims 8 and 9, Takeuchi et al disclose that the second microstructured portion (especially 32b) is made of an organic resin based on an epoxy, acrylic or silicon compound, which gets cured (see column 33 lines 11-33).

Regarding claim 10, Takeuchi et al disclose the metallic material (28a, 28b) placed between the first microstructured and the second microstructured portion.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 11-14, 19, 22-24, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeuchi et al (U.S. Patent 5,862,275) and further in view of Kosuga et al (U.S. Patent 6,156,243).

Regarding claim 11, Tekeuchi et al disclose a micromachine manufacturing method for manufacturing a first microstructured portion (14) to drive a second microstructured portion (32). Although Tekeuchi et al teach using molding step for making layer 26, Tekeuchi et al do not specifically teach a molding step of forming a part of the second microstructured portion (32). Kosuga et al teach a molding method of forming an optical element by mold transfer used in an optical interconnection for mass production and highly accurate alignment (see column 1 through column 3). Thus, it would have been obvious to one with ordinary skill in the art at the time the invention was made to use a molding step to form the second microstructured portion in Tekeuchi et al as taught by Kosuga et al in order to provide high accuracy of the alignment between the optical elements and for the mass production.

Regarding claims 12 and 13, Tekeuchi et al's second microstructured portion functions as an optical switch.

Regarding claim 14, Tekeuchi et al show an array of the first and second microstructured portions and Kosuga et al teach the mold transfer. The second microstructured portions have the same patterns thus Takeuchi et al/Kosuga et al inherently teach using the same mold for the plurality of second microstructured portions.

Regarding claim 19, Takeuchi et al disclose no metallic film formed on a boundary surface (surface between 32a and 32b, see Fig. 1).

Regarding claim 22, Kosuga et al teach etching method (see column 9 lines 14-22). Anisotropic etching and isotropic etching are well known in the art as etching methods thus, it would have been obvious to use anisotropic and isotropic etching in Kosuga et al.

Regarding claim 23, Kosuga et al's teach using a resin for mold (see column 40, lines 7-18).

Regarding claim 24, Kosuga et al teach a mold (first mold) having a transfer molding surface of a predetermined shape and is used for press molding (second mold) (see column 3 lines 59-62).

Regarding claim 27, removing any unnecessary part after the molded portion would have been an obvious step in Takeuchi et al/Kosuga et al.

8. Claims 17, 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeuchi et al/Kosuga et al as applied to claim 11 above, and further in view of Yoon (U.S. Patent 5,917,647).

As described above, Takeuchi et al/Kosuga et al disclose the claimed invention. However, Takeuchi et al/Kosuga et al does not exactly teach how the actuator driving part is made. Yoon et al disclose a method of making an optical actuator driving portion using a photolithography step and sacrifice layer (see column 5 lines 20-30). Thus, it would have been obvious to use a photolithography step and a sacrifice layer as taught by Yoon et al in Takeuchi et al/Kosuga et al to make the optical actuator with a simple conduit structure. Yoon et al show the planarized surface (see Fig. 6b).

9. Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeuchi et al/Kosuga et al as applied to claim 11 above, and further in view of Tamura et al (U.S. Patent 6,017,973, cited during the last office action).

Regarding claims 25 and 26, as described above, Takeuchi et al/Kosuga et al teach all the claimed methods except a pressure-reducing step. Tamura et al teach a method step of producing a molding by placing a mold in a vacuum atmosphere (reduced pressure atmosphere) to reduce the bubbles. Thus, it would have been obvious to one with ordinary skill in the art to apply Tamura et al's method step of reducing pressure in Takeuchi et al/Kosuga et al to reduce the bubbles in Kosuga et al's resin mold.

Allowable Subject Matter

10. Claims 15, 16 and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claims 15 and 16, the closest prior arts of record, Tekeuchi et al/Kosuga et al, fail to teach a third microstructured portion (post) not driven by the first microstructured portion and that is transferred using the same mold used for the second microstructured portion. Using the same mold transfer provides the positional relationship between the second and third microstructured portions with easily controlled high accuracy.

Regarding claim 18, the closest prior arts of record, Tekeuchi et al/Kosuga et al, fail to teach an etching step of a sacrifice layer after the molding step wherein the sacrifice layer is provided around the first microstructured portion. Applicant's method step of removing the sacrifice layer around the first microstructured portion after the molding step protects the first microstructured portion (driving portion) from breaking during mold transfer.

11. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Juliana K. Kang whose telephone number is (703) 305-6259. The examiner can normally be reached on Mondays and Thursdays 7:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rod Bovernick can be reached on (703) 308-4819. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7724 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-3072.


Juliana Kang
April 21, 2003